REMARKS

Claims 1-21 were previously pending in the application.

Claims 1-21 stand rejected.

No claims have been added or canceled in this paper.

Accordingly, claims 1-21 remain pending in the application.

Claims 1-10, 12, and 16-21 stand rejected under 35 U.S.C. § 102(b) as being anticipated by F. S. Hillier and G. J. Lieberman, *Introduction to Operations Research*, 6th ed., McGraw-Hill, Inc., 1995 ("*Hillier*"). Claims 11 and 13-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Hillier*. Applicant offers that the claims are allowable and respectfully requests reconsideration in view of the following remarks.

Rejections Under § 102(b)

Claims 1-10, 12, and 16-21 stand rejected under § 102(b) as being anticipated by *Hillier*. While not conceding that the Examiner's cited reference qualifies as prior art, but instead to expedite prosecution, Applicant has chosen respectfully to traverse the rejection as follows. Applicant reserves the right, for example in a continuing application, to establish that the Examiner's cited reference does not qualify as prior art as to an invention embodiment previously, currently, or subsequently claimed.

Claims 1-10

Applicant submits that pending claims 1-10 are allowable because the cited art fails to describe a variety of limitations in each of these claims. *Hillier* presents textbook discussions regarding mathematical modeling, particularly as related to operations research. *Hillier* at 8. *Hillier* includes background information on standard modeling techniques, *id.* at 10 et seq., and then introduces a general concept known as linear programming, *id.* at 26. *Hillier* provides an example of linear programming as applied to a specific example situation (the "Wyndor Glass" example), *id.* at 26 et seq. It is helpful to note the understanding of "linear programming" as used in this reference. According to *Hillier*:

> [l]inear programming uses a mathematical model to describe the problem of concern. The adjective *linear* means that all the mathematical functions in this model are required to be *linear functions*. The word *programming* does not refer here to computer programming; rather, it is essentially a synonym for *planning*. Thus linear programming involves the *planning of activities* to obtain an optimal result, i.e., a result that reaches the specified goal best (according to the mathematical model) among all feasible alternatives.

Id. at 26.

Hillier subsequently introduces an analogous concept referred to as nonlinear programming. *Id.* at 558-59. The earlier Wyndor Glass example in *Hillier* is then modified to provide examples for discussion of nonlinear programming. *Id.* The nonlinear variations of the earlier example include a problem in which linear constraints (eg., "$2x_2 \leq 12$" and "$3x_1 + 2x_2 \leq 18$") are replaced by a nonlinear constraint (eg., "$9x_1^2 + 5x_2^2 \leq 216$"). *Id.* at 28, 563-64.

Separate from the dichotomy of linear vs. nonlinear constraints, *Hillier* includes an instructive side discussion on the distinction between the concepts of a "local maximum" vs. a "global maximum." *Id.* at 564-65. In the course of this side discussion, *Hillier* tangentially observes that mathematical models may involve one or more independent variables, leading to a differentiation between "single variable" vs. "multiple variables" problems. *Id.* at 565.

While the distinction between local and global maxima is applicable both to single- and multi-variable problems, for simplicity *Hillier* introduces this side-discussion in the simpler context of single-variable mathematics. *Id.* at 565. *Hillier* then goes on to adapt the discussion to the more general multi-variable situations. *Id.* at 565-67. Having established the distinction between local and global maxima, *Hillier* then returns to the nonlinear Wyndor Glass example. *Id.* at 567-68. It can be seen from the formulation of the problem that the nonlinear Wyndor Glass example is a multi-variable problem, and is addressed in *Hillier* with multi-variable techniques. This example is based on an interlaced relationship of two variables x_1 and x_2, respectively representing batches of glass doors and batches of wood-framed windows. *Id.* at 27-28, 567-68. While these two variables are independent of each other, the nonlinear Wyndor Glass example is rooted in an interplay of both of these variables. Accordingly, *Hillier's* nonlinear Wyndor Glass example does not use a single-variable analysis. The *Hillier* treatment

of this example is limited to a simultaneous treatment of the two variables, using multi-variable techniques.

The discussion in *Hillier* fails to describe a number of limitations in Applicant's pending claims. As a first example, independent claim 1 is directed to an automated method that includes a limitation of:

> performing a loading step to form elemental blocks as a function of a single variable with elements being loaded with resources that gate production of the element.

The Examiner cites *Hillier's* Wyndor Glass example, and argues that this example describes the above limitation, specifically using a single variable (p. 564-65). Applicant respectfully disagrees.

This limitation is not present in *Hillier*. The section of *Hillier* cited by the Examiner mentions the concept of single-variable equations, *Hillier* at 565, in a side discussion on local and global maxima. However, single-variable analysis is not used in *Hillier's* nonlinear Wyndor Glass example. *Hillier* returns to multi-variable mathematics when the discussion turns back to the Wyndor Glass example. *Hillier's* Wyndor Glass example is inherently a multi-variable problem that is addressed with multi-variable techniques, and does not present elemental blocks as a function of a single variable. The cited material in *Hillier* does not describe, teach, or suggest "performing a loading step to form elemental blocks as a function of a single variable with elements being loaded with resources that gate production of the element." Thus, this limitation of claim 1 is not present in the cited art.

Second, the automated method of claim 1 also includes a limitation of:

> performing a re-loading step to form elemental blocks as a function of a single variable with elements being reloaded with resources that gate production of the element.

The Examiner again cites *Hillier's* Wyndor Glass example, and argues that this example describes the above limitation, specifically using a single variable (p. 564-65). Applicant respectfully disagrees.

This limitation is also not present in *Hillier*. The section of *Hillier* cited by the Examiner mentions the concept of single-variable equations, *Hillier* at 565, in a side discussion on local and global maxima. However, single-variable analysis is not used in *Hillier's* nonlinear Wyndor Glass example. As discussed above, *Hillier's* Wyndor Glass example is inherently a multi-variable problem that is addressed with multi-variable techniques, and does not present elemental blocks as a function of a single variable. The cited material in *Hillier* does not describe, teach, or suggest "performing a re-loading step to form elemental blocks as a function of a single variable with elements being reloaded with resources that gate production of the element." Thus, this limitation of claim 1 is also not present in the cited art.

Third, the automated method of claim 1 further includes a limitation of:

> solving for the maximum of each elemental block over each associated single variable, wherein the solving is performed by a computer.

The Examiner again cites *Hillier's* Wyndor Glass example (p. 564-65) and further refers to discussions of computer software (p. 606-607), and argues that this example describes the above limitation. Applicant respectfully disagrees.

This limitation is also not present in *Hillier*. *Hillier's* Wyndor Glass example mentions the concept of single-variable equations, *Hillier* at 565, in a side discussion on local and global maxima. However, single-variable analysis is not used in *Hillier's* nonlinear Wyndor Glass example. As discussed above, *Hillier's* Wyndor Glass example is inherently a multi-variable problem that is addressed with multi-variable techniques, and does not present techniques for finding solutions related to elemental blocks and associated single variables. The cited material in *Hillier* does not describe, teach, or suggest "solving for the maximum of each elemental block over each associated single variable, wherein the solving is performed by a computer." Thus, this limitation of claim 1 is also not present in the cited art.

At least for these reasons, independent claim 1 is allowable under § 102(b). Claims 2-11 depend directly or indirectly on claim 1, and are also allowable for at least the same reasons, being dependent on an allowable base claim. Accordingly, Applicant respectfully requests that the pending rejections under § 102(b) to claims 1-11 be withdrawn.

Claims 12 and 16-21

Applicant submits that pending claims 12 and 16-21 are allowable because the cited art also fails to describe a variety of limitations in each of these claims. For example, independent claim 12 is directed to an automated method that includes a limitation of:

> performing a reloading step which reloads components that were unloaded from an element in the loading step.

This limitation is neither described, taught, not disclosed in *Hillier*. In the material cited by the Examiner (pp. 564-65), *Hillier* turns from a discussion on nonlinear programming to present an instructive side discussion on the distinction between the concepts of a "local maximum" vs. a "global maximum." *Id.* at 564-65. In the course of this side discussion, *Hillier* tangentially observes that mathematical models may involve one or more independent variables, leading to a differentiation between "single variable" vs. "multiple variables" problems. *Id.* at 565. However, *Hillier* does not discuss unloading of components from an element in a loading step. Further, *Hillier* does not discuss the reloading of such elements in a reloading step. Further, Applicant sees no other section of *Hillier* that discloses this limitation.

The limitations of claim 12 are therefore not present in the cited art. At least for these reasons, independent claim 12 is also allowable under § 102(b). Independent claim 21 is also allowable at least for similar reasons. Claims 16-20 depend directly or indirectly on claim 12, and are also allowable for at least the same reasons, being dependent on an allowable base claim. Accordingly, Applicant respectfully requests that the pending rejections under § 102(b) to claims 12 and 16-21 be withdrawn.

The Rejections Under §103(a) Depend
Upon an Improper Modification of References

Claims 11 and 13-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Hillier*. Applicant offers that in the pending Office Action, the reference *Hillier* was improperly modified under § 103(a) for a variety of reasons.

For example, Applicant offers that the rejection is improper under § 103(a) because the Examiner's proposed modification would frustrate the intended purpose of *Hillier*. The Examiner has proposed modifying *Hillier* to incorporate the use of an inverse Cholesky

transformation, or to incorporate the use of an elliptical family of distributions. As noted by the Examiner, such transformations and distributions are not disclosed in the cited art. Office Action dated April 7, 2005 at 9, last line; 10, at lines 10-11. The cited material in *Hillier* is used to provide a model of the nonlinear Wyndor Glass example, which is analyzed to completion in that text. If the modeling were modified by changing one or more of the equations therein to incorporate an inverse Cholesky transformation, or to incorporate the an elliptical family of distributions, the resulting modeling would not likely yield a sensible analysis of the nonlinear Wyndor Glass example, or of problems of that type. Such modifications would be inappropriate for the type of example cited in *Hillier*.

"If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." MPEP § 2143.01 (citing *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984)). In this case, the Examiner's proposed modification of *Hillier* would render the teaching in *Hillier* unsatisfactory for the intended purpose of analyzing the nonlinear Wyndor Glass example. Accordingly, this proposed modification is improper under § 103(a).

Further, the cited material in *Hillier* fails to indicate that the analysis therein *needs* such modification. Since the *Hillier* analysis includes a complete treatment of the examples under discussion, the analysis is not found wanting or in need of the types of modifications proposed by the Examiner.

As a second example, Applicant observes that the proposed modification would not reasonably be expected to successfully achieve the claimed invention. The prior art can be modified or combined to reject claims as prima facie obvious as long as there is a reasonable expectation of success. However, "[e]vidence showing there was no reasonable expectation of success may support a conclusion of nonobviousness." MPEP § 2143.01 (citing *In re Rinehart*, 531 F.2d 1048, (CCPA 1976)). In this case, the Examiner's proposed modification of *Hillier* would not yield any useful type of analysis. It is not clear that the proposed modifications, such as the use of an inverse Cholesky transformation or an elliptical family of distributions, would provide any meaningful result when combined with the analysis set forth in the cited Wyndor Glass examples of *Hillier*. Thus, the proposed modification is not reasonably expected to successfully provide a useful result. For this additional reason as well, the Examiner's proposed modification is improper under § 103(a), and claims 11 and 13-15 are patentable under § 103(a).

The Rejections Under 35 U.S.C. §103(a) Depend on Cited Art that Does Not Teach Each Limitation of the Claims

Additionally, even if the modification of *Hillier* were proper under § 103(a), the cited art as modified would not describe, teach, or suggest all of the limitations of the claimed invention. For example, as discussed above, *Hillier* does not disclose a number of limitations of the Applicant's independent claims. This observation applies with equal weight to all of the pending rejections under § 103(a). Further, such limitations are also not present in the *Hillier* reference even with the Examiner's proposed modifications.

For example, claim 11 depends indirectly on claim 1, which includes the limitations of:

> performing a loading step to form elemental blocks as a function of a single variable with elements being loaded with resources that gate production of the element;
>
> performing a re-loading step to form elemental blocks as a function of a single variable with elements being reloaded with resources that gate production of the element;

and

> solving for the maximum of each elemental block over each associated single variable, wherein the solving is performed by a computer.

Claims 13-15 depend on claim 12, which includes the limitations of:

> performing a reloading step which reloads components that were unloaded from an element in the loading step.

As discussed above, these limitations are not disclosed in *Hillier*. For these reasons as well, claims 11 and 13-15 are patentable under § 103(a). In view of these arguments, Applicant respectfully requests that the pending rejections under § 103 to claims 11 and 13-15 be withdrawn.

CONCLUSION

Applicant submits that all claims are now in condition for allowance, and an early notice to that effect is earnestly solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is requested to telephone the undersigned.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P. O. Box 1450, Alexandria, Virginia, 22313-1450, on 2005 June 10.

Attorney for Applicant — Date of Signature: 2005 June 10

Respectfully submitted,

Cyrus Bharucha

Cyrus F. Bharucha
Attorney for Applicant
Reg. No. 42,324
Telephone: (512) 439-5097
Facsimile: (512) 439-5099